



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

MEMORANDUM

January 8, 1998

TO: Karen Schwinn

FROM: Paul Jones
Robert Leidy

SUBJECT: North Bay Aquatic Resources and CALFED Priorities

At your request, we have prepared a compilation of some of the top North Bay projects ranked by the Technical Review Panel (TRP) along with a summary of fishery resources from information obtained from the Department of Fish and Game records, a recent FWS Coordination Act Report on the Napa River Flood Control Project, Rob Leidy's work on his doctoral dissertation, and various monitoring reports for projects in the North Bay.

Potential Role of North Bay Streams in the Recovery of Priority Species

Considered together the Napa River, Sonoma Creek, the Petaluma River and other North Bay streams, and their associated wetlands, have the potential to play a critical role in the CALFED's efforts to recover priority species and their habitats. For example, it is not unreasonable to project that, with concerted efforts directed at habitat restoration and management, steelhead populations in the North Bay could be restored to between 3,000 and 5,000 adults, recognizing the Napa River alone historically supported 6,000 adults. Estimates of the average annual steelhead run size for the Sacramento-San Joaquin River system, including San Francisco Bay tributaries, range between 10,000 and 40,000 adults (Hallock et al. 1961, McEwan and Jackson 1996). This means that under a reasonable restoration scenario, North Bay streams potentially could account for anywhere between 8% and 13% of the current total number of adult steelhead, assuming that currently there are, on average, 40,000 adults in the Sacramento-San Joaquin River system.

Other Important Considerations

There are several other important reasons why the North Bay could play a

pivotal role in the restoration of CAFED priority species and habitats:

(1) From a zoogeographic and ecological perspective, the aquatic and wetland habitats in the North Bay are part of the Central Valley Fish Province. As such, the fish fauna is characteristic of the Central Valley, except that it is more diverse in terms of the number of fish species, largely due to a greater diversity of aquatic and wetland habitats. Populations of certain priority fish species (*i.e.*, splittail, delta smelt, steelhead, longfin smelt, chinook salmon, and striped bass) may or may not be isolated on a regular basis from conspecifics within other geographic areas such as the Delta, Suisun marsh, or the Sacramento-San Joaquin Rivers and their tributaries. The amount and regularity of interchange among species between various geographic regions is unclear. However, they do represent important "populations" from the perspective of developing an effective conservation strategy to recover declining species. Every ecologist knows that it is better not to put "all your eggs in one basket." Rather, it makes more sense to establish multiple "populations" to insure against unforeseen population declines.

(2) The North Bay habitats, particularly the Napa River, Sonoma Creek, and the Petaluma marsh complex, form a contiguous area with high restoration potential for priority species and their habitats. The North Bay marsh complex is both physically and ecologically linked. Therefore, restoration efforts targeted within this geographic area have the potential to result in landscape level benefits to the overall ecosystem health.

(3) Unlike Central Valley drainages, most North Bay streams are characterized by a "natural" hydrograph. With the exception of the Napa River and Novato Creek, there are no large reservoirs that store or divert flows and modify natural flow patterns. Existing water diversions tend to be small, although there may be adverse localized impacts on some tributary streams. Natural flow regimes are critical to the maintenance and restoration of priority species, such as steelhead, and their associated habitats. Even on the Napa River, recent flow regimes closely mimic historic patterns.

(4) The close geographic proximity of North Bay drainages to each other and to the bay and ocean, facilitates the movement of fish species to meet their life history requirements. For example, distances for spawning and out migration of North Bay anadromous species is relatively short compared to anadromous fishes in Central Valley streams that may have to traverse up to 200 miles during upstream and downstream migrations. The proximity of North Bay habitats to the bay and ocean environments may improve spawning success and survivorship.

(5) Restoration and management of North Bay priority habitats on a whole benefits a greater number of priority and other fish species because of the geographic location and diversity of habitat types. For example, restoration of North Bay tidal wetlands has the potential to benefit entire assemblages of fishes (*e.g.*, splittail, longfin smelt, delta smelt, steelhead, chinook salmon, striped bass) as part of a single project.

(6) There are large areas of potential restoration areas within the North Bay and the institutional mechanisms to implement restoration are largely in place. From restoration and acquisition of 1000's of acres of diked historic baylands and riverine habitats to implementing existing watershed plans in all three major basins, the North Bay is ready to make wholesale environmental changes that can significantly further CALFED objectives.

North Bay Projects

1. Tolay Creek. Project No. 326. Approximately 425 acres of salt marsh restoration. This was recommended for funding by the Integration Panel (IP).

Linkage to CALFED priorities: creation of salt marsh habitat that will benefit steelhead, salmon, sturgeon, splittail, striped bass, native fish populations, waterfowl, and shorebirds.

2. Cullinan Ranch Restoration. Project No. 327. Approximately 1100 acres of salt marsh restoration. This also was recommended for funding by the IP.

Linkage to CALFED priorities: creation of salt marsh habitat that could benefit steelhead, salmon, sturgeon, splittail, striped bass, native fish populations, waterfowl, and shorebirds.

NOTE: If the IP considered the linkage to CALFED priority habitats and species sufficient to recommend funding on the above projects, then it stands to reason that several of the following projects that would provide similar, if not identical, habitats and support functions are, therefore, also worthy of full consideration for funding.

3. Napa-Sonoma Marsh Water Control Structure. Project No. 120. Related to the management of salt marsh habitat near Cullinan Ranch.

Linkage to CALFED priorities: creation of salt marsh habitat that could benefit steelhead, salmon, sturgeon, splittail, striped bass, starry flounder, native fish populations, waterfowl, and shorebirds.

4. Napa-Sonoma Marsh Restoration Program. Project No. 139. Involves the monitoring and modeling of the 40,000-acre marsh complex with the goal of satisfying regulatory requirements and design recommendations for restoration of large portions of the area. The initial goal is to provide the information necessary to restore the 7,000-acres of former salt ponds owned by DFG. This will also produce the blueprint for monitoring restoration projects in the entire marsh complex (so that we don't have numerous disjunct monitoring plans that are not coordinated) linked to SFEI's Regional Monitoring Program. This effort will also bridge the gap between the recommendations of the Habitat Goals and the implementation of those goals in the marsh complex.

Linkage to CALFED priorities: creation of salt marsh and possibly brackish or

freshwater marsh habitat that could benefit steelhead, salmon, sturgeon, splittail, striped bass, native fish populations, waterfowl and shorebirds.

5. Petaluma River Greenway Project. Project No. 153. The TRP recommended first-year funding for the ultimate restoration of the Denman and Willow Brook reaches of the Petaluma River, using setback levees and bank stabilization after purchasing selected properties. This project is highly leveraged and the project is ready to implement.

Linkage to CALFED priorities: restoration of adjacent wetland habitat and shaded riverine aquatic habitat that could benefit steelhead, salmon, splittail, possibly Delta smelt which occur in the tidal reaches of the River.

6. Hamilton Wetland Restoration. Project No. 140. This project could restore up to 2,700 acres of tidal wetlands immediately adjacent to San Pablo Bay, possibly by making beneficial use of up to 33 million cubic yards of dredged material. This project is additionally supported by LTMS and might use material from the Port of Oakland's 50'-Deepening Project.

Linkage to CALFED priorities: creation of salt marsh habitat that could benefit steelhead, salmon, green sturgeon, splittail, striped bass, waterfowl (including clapper rail) and shorebirds, and the salt marsh harvest mouse.

7. Napa River Wetland Acquisition. Project No. 131. The Napa County Land Trust proposes to purchase 956 acres of land adjacent to the Napa River. Much of the land would be re-connected to the floodplain of the river and restored variably to tidal action. This project is integral to the Napa River Flood Management Project sponsored by the Sacramento Corps District and the Community Coalition.

Linkage to CALFED priorities: creation of brackish marsh and salt marsh habitat and improvements in instream aquatic habitat in the Napa River that could benefit steelhead, salmon, sturgeon, splittail, Delta smelt, striped bass, waterfowl, and shorebirds.

8. Napa River Watershed Stewardship. Project No. 92. This watershed project is sponsored by the Napa County RCD, which has a distinguished track record in watershed protection activities in the region. NCRCD will expand stewardship activities and watershed monitoring, and establish demonstration sites for levee setback projects, floodplain restoration, and riparian habitat restoration.

Linkage to CALFED priorities: improvements in shaded riverine habitat, instream aquatic habitat, and tidal freshwater habitat (Huichica Creek) that could benefit steelhead, sturgeon, splittail, striped bass, the endangered California freshwater shrimp, native fish assemblages, waterfowl, and shorebirds.

9. Sonoma Creek Watershed Restoration Program. Project No. 113. This watershed project is sponsored by the Southern Sonoma County RCD, with cooperation of the Sonoma Valley Vintners and Growers Assn, the Sonoma Ecology Center, and SFEI.

The latter two groups will oversee use of the Watershed Science Plan to establish baseline conditions in the watershed, while the RCD, the Ecology Center, and the Growers Assn will implement habitat restoration in the creek to improve conditions primarily for steelhead migration and spawning.

Linkage to CALFED priorities: improvements to shaded riverine and instream aquatic habitats for steelhead, California freshwater shrimp, and migratory riparian bird species.

Priority Species and Habitat Linkages to CALFED

Napa River

The Napa River supports several priority habitats and fish species as identified by CALFED. Priority habitats utilized by fishes include: 1) freshwater tidal perennial aquatic, instream aquatic, shaded riverine aquatic, saline emergent wetland, and midchannel island and shoal. Tidal freshwater, brackish and saline open water and wetland habitats along the lower reaches of the Napa River and the adjacent marsh complex provide habitat for populations of at least five CALFED priority species: steelhead trout (*Oncorhynchus mykiss irideus*), splittail (*Pogonichthys macrolepidotus*), delta smelt (*Hypomesus transpacificus*), longfin smelt (*Spirinchus thaleichthys*), and striped bass (*Morone saxatilis*) (USFWS Coordination Act Report, letter dated December 1, 1997; R. Leidy, pers. comm).

Steelhead trout migrate up the Napa River and its tributaries to spawn and rear. One estimate indicates that the Napa River drainage may historically have supported up to 6,000 adult steelhead (USFWS 1997). Qualitative estimates place the current number of adult fish at a few hundred adult steelhead, although this estimate is not supported by quantitative data (USFWS 1997). Stream surveys by EPA between 1994-1997 recorded juvenile rainbow/steelhead trout within certain reaches of the Napa River at up to 200 fish/30m of stream (R. Leidy, unpublished data). A 1962-63 report by CDFG estimated 192 miles of steelhead nursery and spawning habitat within the Napa River drainage (CDFG Stream Survey Files, Yountville). The CDFG (1977) estimated 35 miles of nursery habitat available to steelhead within the Napa River drainage. Recent surveys conducted by EPA have confirmed that the Napa River contains significant amounts of fair- to high-quality steelhead spawning and rearing habitat, and that the potential is high to successfully restore degraded steelhead spawning and rearing habitat along the Napa River and its tributaries through the implementation of various remediation and watershed management programs.

Approximately 30 species of fishes have been documented within the Napa River and its wetlands (R. Leidy, unpublished data). The lower Napa River is also an important nursery and feeding area for striped bass. In addition, fish surveys over the last 25 years indicate that juvenile and adult splittail are locally common within Napa River wetland complex. Other fishes of interest known to utilize the lower Napa River and wetland complex include river lamprey (*Lampetra ayersi*), delta smelt (*Hypomesus transpacificus*), topsmelt (*Atherinops affinis*), longfin smelt (*Spirinchus thaleichthys*), threadfin shad (*Dorosoma petenense*), American shad (*Alosa sapidissima*), chinook salmon (*Oncorhynchus tshawytscha*), white sturgeon (*Acipenser transmontanus*), yellowfin goby (*Acantogobius flavimanus*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*M. dolomieu*), white catfish (*Ictalurus melas*), Sacramento squawfish

(*Ptychocheilus grandis*), Sacramento sucker (*Castostomus occidentalis*), tule perch (*Hysteroecarpus traskii*), shiner perch (*Cymatogaster aggregata*), inland silverside (*Menedia audens*), threespine stickleback (*Gasterosteus aculeatus*), and starry flounder (*Platichthys stellatus*). Several of the above species (i.e., delta smelt, steelhead, Sacramento splittail, river lamprey, longfin smelt, and hardhead) are either Federally-listed threatened or endangered species, or have special protective status under California state law or regulations.

In addition to steelhead and striped bass, non-tidal reaches of the Napa River and its tributaries support healthy assemblages of native fishes. These include Pacific lamprey (*Lampetra tridentata*), chinook salmon, resident rainbow trout (*O. m. mykiss*), California roach (*Hesperoleucas symmetricus*), hitch (*Lavinia exilcauda*), Sacramento squawfish, hardhead (*Mylopharodon conocephalus*), Sacramento sucker, tule perch, threespine stickleback, prickly sculpin, and riffle sculpin (*Cottus gulosus*). Native fish assemblages comprised of 5-7 species, with no or only a few exotic species, may be found in the middle reaches of the Napa River. Headwater reaches often contain 2-3 native fishes with no exotics. Functioning assemblages of native fishes are rare within the Central Valley Fish Province. With proper management the Napa River represents a unique opportunity to protect native fish communities. Finally, the Napa River is one of only several streams that contains large populations of the California freshwater shrimp (*Syncares pacifica*), a federally-listed endangered species.

Sonoma Creek

Sonoma Creek supports several priority habitats and fish species as identified by CALFED. Priority habitats utilized by fishes include: 1) freshwater tidal perennial aquatic, 2) instream aquatic, 3) saline emergent tidal wetlands; and 4) shaded riverine aquatic. Tidal freshwater, brackish and saline open water and wetland habitats along the lower reaches of Sonoma Creek and the adjacent marshes provide habitat for populations of at least two CALFED priority species: steelhead and striped bass.

Historically, Sonoma Creek was known internationally as a premier steelhead stream. It is likely that Sonoma Creek historically supported a larger run of steelhead than the Napa River (estimated at 6,000 adults). Sonoma Creek and its tributaries currently supports a run of steelhead of unknown size (CDFG Stream Files, Yountville, R. Leidy, unpubl. data, Southern Sonoma County Recourse Conservation District 1996). Recent surveys conducted by EPA have confirmed that the Sonoma Creek contains significant amounts of good- to high-quality steelhead spawning and rearing habitat, and that the potential is also high to successfully restore degraded steelhead spawning and rearing habitat on Sonoma Creek and its tributaries through the implementation of various remediation and watershed management programs.

In addition to steelhead, the following species occur with the Sonoma Creek watershed: Pacific lamprey; resident rainbow trout; California roach; Sacramento

squawfish; Sacramento sucker; prickly sculpin, riffle sculpin; striped bass; largemouth bass; and common carp (SSCDCD 1996, Leidy, unpubl. Data). Also, there are several T/E species in the watershed, including the California freshwater shrimp, red-legged frog, clapper rail, and salt marsh harvest mouse.

Petaluma River

The Petaluma River also supports several priority habitats and fish species as identified by CALFED. Priority habitats utilized by fishes include: 1) freshwater tidal perennial aquatic, 2) instream aquatic, 3) shaded riverine aquatic, 4) saline emergent wetland, and 5) midchannel island and shoal. Tidal freshwater, brackish open water and wetland habitats along the lower reaches of the Petaluma River provide habitat for populations of three CALFED priority species: steelhead trout (*Oncorhynchus mykiss iredeus*), splittail (*Pogonichthys macrolepidotus*), and striped bass (*Morone saxatilis*) (USFWS Coordination Act Report, letter dated December 1994; R. Leidy, pers. comm). The Petaluma River also has a small run of chinook salmon. Steelhead migrate through the lower Petaluma River to spawn in its main tributary streams, including Adobe, Lynch, Willow Brook, and Lichau Creeks (WESCO 1988, Bill Cox, CDFG, pers. comm). Sacramento splittail utilize the Petaluma River as a migration corridor, and likely also as spawning and rearing habitat (USFWS 1994).

There have been extensive efforts in recent years to restore steelhead habitat on Adobe Creek, a primary tributary to the Petaluma River.

Other North Bay Streams and Wetlands (Marin County)

Several other North Bay streams within Marin County are known to support steelhead runs and priority habitats (*i.e.*, instream aquatic and shaded riverine aquatic). These streams include Arroyo Corte Madera del Presideo, Corte Madera, Miller, and Novato creeks and several of their tributaries (R. Leidy, unpublished data). In addition, Corte Madera/San Anselmo and Mill Creeks in Marin County contained coho salmon (*Oncorhynchus kisutch*) historically until at least 1981, and have been targeted as potential restoration areas for this species by the National Marine Fisheries Service (NMFS 1997, Leidy 1984), and will likely be designated as essential habitat by the NMFS this year (M. Helvey, pers. communication).

Other North Bay areas and considerations for watershed resources: Sonoma Baylands has recently reported the occurrence of fall-run chinook salmon in the pilot unit, as well as starry flounder (*Platichthys stellata*) and Pacific herring (*Clupea pallasii*) (US Army Corps of Engineers Annual Monitoring Report). Similarly, the monitoring of the restoration of DFG's pond 2A (a former salt pond) has revealed the presence of striped bass, splittail, inland silversides (*Menidia audens*), staghorn sculpin (*Leptocottus armatus*), longjawed mudsucker (*Gillichthys mirabilis*), northern anchovy (*Engraulis mordax*), and American shad.